IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Subhash C. Roy

Group Art Unit: 2661

Serial No.: 09/717,147

Examiner: Brian D. Nguyen

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Title: A Method for Arbitrating Bandwidth in a Communications Switch

Mail Stop Appeal Brief-Patents
Commissioner for Patents
Alexandria, VA 22313-1450

Sir:

APPLICANT'S BRIEF ON APPEAL

A Notice of Appeal to the Board of Patent Appeals and Interferences was filed on November 26, 2003 in which Applicant appealed from the final rejection of claims 1-5, 11-17, 23 and 24 , dated September 10, 2003. The large entity appeal brief fee of $330 is enclosed herewith. If any additional fees are required, please charge such fees to deposit account no. 07-1732.

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(1) REAL PARTY IN INTEREST

The real party in interest is Onex Communications Corporation by virtue of an assignment recorded at Reel 011316, Frame 0635. Onex Communications Corporation is now a wholly owned subsidiary of Transwitch Corporation.

(2) RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences which are related to this application or this appeal.

(3) STATUS OF CLAIMS

Claims 1-5, 11-17, 23 and 24 were finally rejected on September 10, 2003.

Dependent claims 6-10 and 18-22 are objected to.

(4) STATUS OF AMENDMENTS

The Amendment after final rejection dated September 25, 2003 has been entered.

(5) SUMMARY OF THE INVENTION

The application discloses a communications switch having many novel features which are claimed in this and four other applications which share the same disclosure. Each of the four other applications has issued as a patent. The issued patents are Numbers 6,646,983, 6,636,515, 6,636,511, and 6,631, 130. The claims which are appealed herein deal with methods and apparatus for arbitrating bandwidth in a communications switch. The methods (claims 1-12) of the invention include generating a repeating data frame having a plurality of rows, making requests during row N for space in row N+1, and granting the requests through an out-of-band link. These methods are described in the specification at pages 9, 20-22, Figures 3, 3b, and 3c. The apparatus (Claims 13-24) according to the invention includes a port processor (Figure 1) and a switch element (Figure 2). The port processor unpacks incoming TDM, Packet, and ATM data and frames it according to the data frame described with reference to Figure 3. The port processor also generates requests for bandwidth (page 21, Figures 3b and 3c) which are formed by the arbiter 56 (pages 32-40). The requests for bandwidth relate only to the ATM and packet data. Bandwidth for the TDM data is provisioned in the frame.

The requests are granted or denied by the arbitrators 134, 144 in the switch elements and grants are inserted into a grant_fifo where they are read by the grant framer and serializer 62 which creates a grant message for transmission through the out-of-band link.

According to the appealed dependent claims, the requests include through-the-switch routing information and priority level information (claims 2 and 14). Each request is buffered at each stage of the switch and low priority requests are discarded when the buffer reaches a threshold (claims 3 and 15). The granting of requests is performed by returning the requests which were not discarded (claims 4 and 16). Space is requested in 52-byte chunks (claims 5 and 17). The requests are made in-band (claims 11 and 23) or the requests are made out-of-band (claims 12 and 24).

(6) THE ISSUES

A. Whether claims 1, 2, 12-14 and 24 are obvious over Gorshe.

B. Whether claims 3, 4, 15, and 16 are obvious over Gorshe in view of Chiussi et al.

C. Whether claims 5 and 17 are obvious over Gorshe in view of Bergantino et al.

D. Whether claims 11 and 23 are obvious over Gorshe in view of Chow et al.

(7) GROUPING OF THE CLAIMS

The rejected claims do not stand or fall together, but are divided into six groupings for the reasons set forth in the ARGUMENT section below:

a) Claims 1, 12, 13, and 24

b) Claims 2 and 14

c) Claims 3 and 15

d) Claims 4 and 16

e) Claims 5 and 17

f) Claims 11 and 23

(8) ARGUMENT

A. Claims 1, 2, 12-14 and 24 are patentable over Gorshe.

    1. Claims 1, 12, 13, and 24

Claims 1 and 13 are independent method and apparatus claims which parallel each other, the apparatus claim simply calling for means to perform each step recited in the method claim. These steps are easily recited and understood. They comprise:

"a) generating a repeating data frame having a plurality of rows;

b) making requests during row N for space in row N+1; and

c) granting the requests through an out-of-band link."

It is submitted that for purposes of this appeal, the most important element of claim 1 is the requesting during row N for space during row N+1.

Gorshe discloses communication within a repeating STS-1 frame which is similar to the claimed frame. In the Gorshe system, users are preassigned time slots in the STS-1 payload during which they may request access to the overhead part of the STS-1 frame. Thus, any one user will make a request for space during a row N of the frame. However, the request is not a request for space in row N+1. Requests are granted on the expiration

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of a counter which is set by a number of factors including the amount of traffic preceding the requesting user. Thus, it is unknown, both at the time the request is made and the time that the request is granted, where a requester will be granted space in response to a request.

The Examiner admits that Gorshe does not teach or suggest that requests made during row N are for space in row N+1. It is the Examiner's opinion that making requests during row N for space in row N+1 is obvious because "space could be provided in any row subsequent to row N and no unexpected result is produced by providing space in row N+1."

The Examiner's reasoning is flawed on two counts. First, it is the Applicant's position that absent the present invention, it is not possible to provide space in row N+1 following a request in row N and that is why it is not shown or suggested in the prior art. Thus, contrary to the Examiner's assertion space could not be provided in any row subsequent to row N.

Second, unexpected results are an indication of non-obviousness, but the lack of unexpected results is not an indication of obviousness. See, e.g., MPEP §716.01(a). "Note that the lack of objective evidence of non-obviousness does not weigh in favor of obviousness. Miles Labs. Inc. v. Shandon Inc., 997 F.2d 870, 27 USPQ2d 1123, 1129 (Fed. Cir. 1993), cert. denied, 127 L. Ed. 232 (1994). However, where a *prima facie*

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case of obviousness is established, the failure to provide rebuttal evidence is dispositive." Id. Here, the Examiner has not made a *prima facie* case of obviousness.

MPEP §706.02(j) defines what is required of the Examiner to make a *prima facie* case of obviousness (i.e. what is required to make a §103 rejection). The Examiner has not met his burden of making a proper rejection. The cited art does not teach or suggest the invention and no evidence has been offered by the Examiner to supplement the shortcomings of the prior art. The Examiner's rejection is based on the unsupported statements that the claimed invention could have been done before and that no unexpected result is produced by the invention. This may be the Examiner's opinion, but that is not enough to make a §103 rejection. Pursuant to MPEP §2144.03, the Applicant may require the Examiner to show evidence of what he assumes to be common knowledge. Despite repeated requests by the Applicant, as of this date, the Examiner has not shown any evidence to support his statement that "space could be provided in any row subsequent to row N and no unexpected result is produced by providing space in row N+1." Absent evidence which supports this statement, the Examiner's rejection is clearly improper.

In addition, the Examiner has not provided any incentive for one skilled in the art to modify Gorshe.

> The prior art must provide a motivation or reason for the worker in the art, without the benefit of appellant's specification, to make the necessary changes in the reference device.' Ex parte Chicago Rawhide Mfg. Co., 223 USPQ 351, 353 (Bd. Pat. App. & Inter. 1984)." MPEP §2144.04(VI).

It is respectfully submitted that the art of record does not provide any incentive to have requests made in row N for space in row N+1. The prior art shows requests made for space when it becomes available and requests made for space in the next frame, but not for space in the next row of the same frame. The reason why the prior art does not provide any incentive to make requests in one row for space in the very next row is that, prior to the present invention, it could not be done. Thus, under the rule of Ex parte Chicago Rawhide Mfg. Co., the claims of the instant application are not *prima facie* obvious.

It should also be noted that even if the requests made in the prior art for space when it becomes available were, by some miraculous event, granted for space in the next row, the limitations of claims 1 and 13 would still not be met. In the prior art, the requests are for space in any row. In the appealed claims, the requests are for space in the next row and not in any other row but the next row.

For the foregoing reasons, claims 1 and 13 are patentable over Gorshe.

2. Claims 2 and 14

These claims which depend from claims 1 and 13 respectively specify that the requests include through-the-switch routing information and priority level information. In finally rejecting these claims, the Examiner cites col. 3, lines 61-63 of Gorshe. These lines state the following: "In one embodiment, the assigned time slots for packet requests

are each associated with a queue with an assigned priority." It is unclear what this sentence means. It seems to suggest that priority levels are associated with queues which are associated with time slots for requests. In other words, it seems to suggest that requests made during certain time slots are assigned a certain priority. It does not seem to suggest that the requests include priority level information as claimed in claims 2 and 14. Nevertheless, even if this sentence were to suggest that requests include priority level information, it certainly does not suggest that the requests include through-the-switch routing information. The Examiner has not addressed this latter point.

For the foregoing reasons, claims 2 and 14 are patentable over Gorshe.

B. Claims 3, 4, 15, and 16 are patentable over Gorshe and Chiussi et al. whether taken alone or together.

1. Claims 3 and 15

These claims specify that each request is buffered at each stage of the switch and low priority requests are discarded when the buffer reaches a threshold. The significance of the phrase "at each stage of the switch" dovetails with the previously discussed "through-the switch routing information" in claims 2 and 14 from which claims 3 and 15 depend. With this mechanism in place, each stage of the switch in the through-the-switch route plays a role in granting requests. As a request element moves through switch stages, it can be discarded by any stage along the route before it reaches the last stage. This allows for efficient and rapid processing of requests.

The Examiner finally rejected these claims as obvious over Gorshe in view of Chiussi. It is the Examiner's position that the subject matter of claims 3 and 15 is taught by Chiussi at col. 3. lines 13-26, Figure 11, and the Abstract. In the Examiner's words "Chiussi discloses a system using multistage switch and buffering the request at each stage of the switch." The stated incentive to combine these references is "so that more switching can be performed by the switch."

As with the previous rejections, the Examiner seems to have ignored important language in the claims and misinterpreted other language. In this rejection, the Examiner seems to have ignored the claim limitation of discarding low priority requests and has confused data with requests. This misinterpretation is illuminated by the stated incentive to combine which emphasizes the issue of a multistage switch rather than the issues of buffering and discarding requests. In reality, Chiussi discloses buffering cells but does not disclose buffering requests and certainly does not disclose discarding low priority buffered requests when a buffer reaches a threshold.

For the foregoing reasons, claims 3 and 15 are patentable over Gorshe and Chiussi, taken individually or in combination.

2. Claims 4 and 16

These claims, which depend from claims 3 and 15, provide that requests are granted by returning the requests which have not been discarded before reaching the

egress of the switch. The Examiner has finally rejected these claims on the same grounds as the rejection of claims 3 and 15. Thus, the Examiner has completely ignored the limitations of these claims. It is clear that neither Gorshe nor Chiussi teach or suggest this handling of requests for bandwidth.

For the foregoing reasons, claims 4 and 16 are patentable over Gorshe and Chiussi, taken individually or in combination.

C. Claims 5 and 17 are patentable over Gorshe and Bergantino et al. whether taken alone or together.

These claims, which depend from claims 1 and 13, specify that each request for space is for a 52-byte chunk. In finally rejecting these claims, the Examiner stated that "Bergantino discloses a 52-byte chunk" at col. 15, lines 27-28 and that the incentive to combine these references was "in order to meet specific needs."

Bergantino discloses an ATM cell processing system wherein the HEC byte is checked and discarded before storing the cell. Thus, the stored cell occupies 52 bytes of storage space. However, there is no indication in Bergantino that any row of a data frame may have a size in excess of 52 bytes and that all requests be made for 52 byte chunks. Moreover, the stated incentive to combine is "imaginative".

For the foregoing reasons, claims 5 and 17 are patentable over Gorshe and Bergantino, taken individually or in combination.

D. Claims 11 and 23 are patentable over Gorshe and Chow et al. whether taken alone or together.

These claims, which depend from claims 1 and 13 specify that the requests for bandwidth are made in-band. The Examiner's final rejection of these claims is based on col. 26, lines 26-27 of Chow et al. which describes in-band messages and out-of-band messages. According to the Examiner, whether requests are made in-band or out-of-band is a matter of design choice.

The Examiner's rejection is improper because the Chow et al. patent is not concerned with a telecommunications switch and is not concerned with arbitrating bandwidth in a communications switch. Moreover, there is no incentive to combine the Chow et al. reference with Gorshe, and the Examiner has not set forth any such incentive. The Examiner's reliance on "matter of design choice" is not well founded for the following reasons

An "obvious matter of design choice" is not a statutory rejection. There is no law or rule regarding the grounds for making such a rejection. However, the MPEP instructs Examiners that "if the facts in a prior legal decision are sufficiently similar to those in an application under examination, the examiner may use the rationale used by the court."

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See MPEP §2144.04. Here, the Examiner did not refer to any particular legal decision having facts similar to the instant application.

Although the Examiner did not refer to any particular legal decision having facts similar to the instant application, MPEP §2144.04 provides seven examples of when a claim may be considered *prima facie* obvious in view of a prior legal decision. These examples are: (1) aesthetic design change, (2) elimination of a step or an element and its function, (3) automating a manual activity, (4) change in size, shape, or sequence of adding ingredients, (5) making portable, integral, separable, adjustable, or continuous, (6) reversal, duplication, or rearrangement of parts, and (7) purifying an old product. It is respectfully submitted that none of these seven examples suggests the facts of the present application.

For the foregoing reasons, claims 11 and 23 are patentable over Gorshe and Chow et al., taken individually or in combination.

E. Conclusion

In light of all of the above, it is submitted that the claims are in order for

allowance, and the Applicant respectfully requests that the Board direct the Examiner to

allow the case.

Respectfully submitted,

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(9) APPENDIX

1. (previously presented) A method for arbitrating bandwidth in a communications switch, comprising:

  a) generating a repeating data frame having a plurality of rows;

  b) making requests during row N for space in row N+1; and

  c) granting the requests through an out-of-band link.

2. (original) A method according to claim 1, wherein:

      each request includes through-the-switch routing information and priority level information.

3. (previously presented) A method according to claim 2, wherein said switch is a multistage switch, said method further comprising:

  d) buffering the request at each stage of the switch;

  e) discarding low priority requests when the buffer reaches a threshold.

4. (original) A method according to claim 3, wherein:

      said step of granting requests includes returning requests which have not been discarded before reaching the egress of the switch.

5. (original) A method according to claim 1, wherein:

      each request for space is for a 52-byte chunk of space.

6. (original) A method according to claim 5, wherein bandwidth is arbitrated among ATM cells and variable length packets, said method further comprising:

 d) segmenting each packet larger than 52-bytes into a plurality of 52-byte chunks.

7. (original) A method according to claim 6, wherein:

 each request includes through-the-switch routing information and priority level information.

8. (previously presented) A method according to claim 7, wherein said switch is a multistage switch, said method further comprising:

 e) buffering the request at each stage of the switch;

 f) discarding low priority requests when the buffer reaches a threshold.

9. (original) A method according to claim 8, wherein:

 said step of granting requests includes returning requests which have not been discarded before reaching the egress of the switch.

10. (original) A method according to claim 9, further comprising:

 g) discarding requests for all following segments of a packet when a request for one segment of the packet has been discarded.

11. (original) A method according to claim 1, wherein:

 said requests are made in-band.

12. (original) A method according to claim 1, wherein:

said requests are made out-of-band.

13. (previously presented) An apparatus for arbitrating bandwidth in a communications switch, comprising:

a) means for generating a repeating data frame having a plurality of rows;

b) means for making requests during row N for space in row N+1; and

c) means for granting the requests through an out-of-band link.

14. (previously presented) An apparatus according to claim 13, wherein:

each request includes through-the-switch routing information and priority level information.

15. (previously presented) An apparatus according to claim 14, further comprising:

d) means for buffering the request at each stage of the switch; and

e) means for discarding low priority requests when the buffer reaches a threshold.

16. (previously presented) An apparatus according to claim 15, wherein:

said means for granting requests includes means for returning requests which have not been discarded before reaching the egress of the switch.

17. (previously presented) An apparatus according to claim 13, wherein:

each request for space is for a 52-byte chunk of space.

18. (previously presented) An apparatus according to claim 17, wherein bandwidth is arbitrated among ATM cells and variable length packets, said apparatus further comprising:

d) means for segmenting each packet larger than 52-bytes into a plurality of 52-byte chunks.

19. (previously presented) An apparatus according to claim 18, wherein:

each request includes through-the-switch routing information and priority level information.

20. (previously presented) An apparatus according to claim 19, further comprising:

e) means for buffering the request at each stage of the switch; and

f) means for discarding low priority requests when the buffer reaches a threshold.

21. (previously presented) An apparatus according to claim 20, wherein:

said means for granting requests includes means for returning requests which have not been discarded before reaching the egress of the switch.

22. (previously presented) An apparatus according to claim 21, further comprising:

g) means for discarding requests for all following segments of a packet when a request

for one segment of the packet has been discarded.

23. (previously presented) An apparatus according to claim 13, wherein:

said requests are made in-band.

24. (previously presented) An apparatus according to claim 13, wherein:

said requests are made out-of-band.